

CLAIMS

We Claim:

1. A method of sampling for the presence of fragile whisker-like metallic particulates in a data center comprising:

5 (a) providing a tool capable of capturing and retaining the whisker-like metallic particulates in their fragile condition;

(b) locating a surface of the data center where metallic particulates may be present; and

10 (c) extracting from the surface any whisker-like metallic particulates present in substantially their fragile condition.

2. A method as in claim 1 wherein the tool comprises an adhesive portion for extracting the whisker-like metallic particulates.

15 3. A method as in claim 2 wherein the adhesive portion is a conductive adhesive.

4. A method as in claim 3 wherein the conductive adhesive is a carbon conductive material.

20 5. A method as in claim 2 wherein the step of extracting is carried out by pressing the adhesive portion on the surface.

25 6. A method as in claim 1 wherein the step of extracting further comprises sampling a density of the whisker-like metallic particulates over a predetermined surface area.

7. A method as in claim 1 further comprising the step of recording the location of the surface.

30 8. A method as in claim 1 further comprising the step of storing the sample such that the sample protected from substantial contamination.

9. A method as in claim 8 wherein the sample is stored in an enclosure such that the adhesive portion does not contact the enclosure.

10. A method as in claim 2 wherein the tool is modular and the adhesive portion is removable from a handle portion.

11. A method as in claim 1 wherein the fragile whisker-like metallic particulates are selected from the group consisting of zinc whiskers, cadmium whiskers, tin whiskers, and aluminum whiskers.

12. A method as in claim 1 further comprising the steps of:

(a) locating a second surface of the data center wherein whisker-like metallic particulates may be present;

(b) providing a second tool capable of capturing and retaining the whisker-like metallic particulates in their fragile condition; and

(c) extracting from the second surface any whisker-like metallic particulates present in substantially their fragile condition.

13. A method as in claim 1 wherein the surface is on a floor tile.

14. A method as in claim 13 wherein the step of extracting is from the bottom of the floor tile.

15. A method for discovering the presence of an undesired whisker-like metallic particulate in a data center comprising:

(a) locating a surface of the data center where the presence of a whisker-like metallic particulate is suspected;

(b) extracting any whisker-like metallic particulate that may be present on the surface onto an adhesive intermediate substrate; and

(c) confirming whether or not any whisker-like metallic particulates are present on the intermediate substrate.

16. A method as in claim 15 wherein the step of extracting any whisker-like metallic particulates is done such that the particulates are substantially retained in their fragile condition.

5 17. A method as in claim 15 wherein the adhesive intermediate substrate is conductive.

18. A method as in claim 17 wherein the intermediate substrate comprises conductive carbon.

10 19. A method as in claim 17 wherein the step of confirming whether or not any whisker-like metallic particulates are present is done with an electron microscope.

15 20. A method as in claim 19 wherein the electron microscope is selected from the group consisting of a scanning electron microscope, a field emission electron microscope, and a transmission electron microscope.

20 21. A method as in claim 15 wherein the metallic particulates are selected from the group consisting of zinc whiskers, tin whiskers, cadmium whiskers, aluminum whiskers, and combinations thereof.

25 22. A method as in claim 15 wherein the step of the step of confirming whether or not any whisker-like metallic particulates are present further comprises the step of characterizing any whisker-like metallic particulates present with respect to geometry, surface properties, and density.

30 23. A method as in claim 15 further comprising the step of characterizing the whisker-like metallic particulates using energy dispersive spectroscopy (EDS).

24. A method for discovering the presence of an undesired whisker-like metallic particulate in a data center comprising:

(a) providing a tool having a conductive adhesive portion, said conductive adhesive portion being capable of capturing and retaining the whisker-like metallic particulates in their fragile condition;

(b) locating a surface of the data center where metallic particulates may be present;

(c) extracting from the surface any whisker-like metallic particulates present in substantially their fragile condition using the tool; and

(d) confirming with an electron microscope whether or not any whisker-like metallic particulates are present on the conductive adhesive portion of the tool.

25. A method as in claim 24 further comprising the step of characterizing any whisker-like metallic particulates confirmed to be present for geometry, surface properties, and density.